

**DETAILED ACTION**

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William K. Konrad on 09/25/2008.

2. The application has been amended as follows:

- Claim1, A method for sending data from a source to a destination, comprising:

a host of the source providing to a sending agent of the source, virtual memory addresses of data to be sent to a destination wherein the data is stored in a plurality of unpinned physical locations of the source, each location having a physical address and a virtual memory address which is mapped to the physical address and wherein the physical locations include locations of a first memory and locations of a second memory;

the sending agent providing to the host of the source at least some of the virtual memory addresses of the data to be sent to the destination;

the host of the source identifying to the sending agent the data addressed by the virtual memory addresses provided by the sending agent wherein the host identifying data comprises the host providing to the sending agent the physical addresses of the

locations containing the data addressed by the virtual memory addresses provided by the sending agent, and the data identified by the host is stored in the first memory and the physical memory addresses provided by the host are physical memory locations of the first memory containing the data addressed by the virtual addresses provided by the sending agent; and

the sending agent sending the identified data to the destination;

the method further comprising:

pinning the physical memory locations of the first memory provided by the host to the sending agent to prevent the data addressed by the virtual addresses provided by the sending agent from being swapped to the second memory;

the sending agent retrieving from the pinned physical memory locations of the first memory, the data addressed by the virtual addresses provided by the sending agent; and

unpinning the pinned physical memory locations of the first memory after the sending agent sends to the destination the data addressed by the virtual addresses provided by the sending agent.

- Claim 2, The method of claim 1 wherein ~~the host identifying data comprises the host providing to the sending agent the data addressed by the virtual addresses provided by the sending agent~~, said method further comprising comprises the sending agent storing the data received from the host in a buffer of the sending agent.

- Claim 3, (Canceled)

- Claim 4, (Canceled)

- Claim 5, (Canceled)

- Claim 6, The method of claim 1 further comprising receiving from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination; wherein the virtual memory addresses provided by the sending agent to the host are the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination.

- Claim 7, The method of claim 1 further comprising:

- receiving from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination;

- the sending agent providing to the host the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination;

- the host identifying to the sending agent the unacknowledged data addressed by the virtual memory addresses provided by the sending agent; and

- the sending agent resending the identified unacknowledged data to the destination.

- Claim 8, The method of claim 1 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent at least one data structure which includes in an address field containing the virtual address of one of a plurality of memory locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data; and

a sequence number field containing a value representing a packet sequence number associated with data within the block of data.

- Claim 9, The method of claim 1 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent a plurality of data structures, wherein each data structure includes in an address field, the virtual address of one of a plurality of memory locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data, a sequence number field containing a value representing the packet sequence number associated with data within the block of data; and a link field containing the virtual address of another data structure of the plurality of data structures.

- Claim 10, The method of claim 1 wherein ~~the physical locations include locations of a first memory and a second memory and the data to be sent to the destination is stored in the first memory, the method further comprising, pinning the locations of the first memory storing the data to be sent to prevent the data to be sent from being swapped to the second memory;~~  
~~the host providing to the sending agent in addition to the virtual memory addresses of the data to be sent, the physical addresses of the locations of the first memory storing the data to be sent;~~  
~~the sending agent retrieving from the pinned locations of the first memory, the data to be sent; and~~  
~~unpinning the pinned locations of the first memory storing the data to be sent after the sending agent retrieves the data from the pinned locations of the first memory storing the data to be sent;~~

~~and wherein~~ the sending by the sending agent of the identified data to the destination includes sending the identified data in data packages over a network to the destination in accordance with at least a transport protocol.

- Claim 11, A system adapted to communicate with a destination, comprising:

memory;

a processor coupled to the system memory;

an operating system executable by the processor in memory;

a network adaptor;

data storage;

a data storage controller adapted to manage Input/Output (I/O) access to the data storage; and

a device driver executable by the processor in the memory,

wherein the memory and the data storage each comprise physical locations adapted to store data, each location having a physical address and a virtual address which is mapped to the physical address; and

wherein at least one of the operating system and device driver is adapted to provide a host and at least one of the device driver and the network adaptor is adapted to provide a sending agent wherein:

(i) the host provides to the sending agent, virtual memory addresses of data to be sent to a destination wherein the data is stored in a plurality of unpinned physical locations of the memory,

- (ii) the sending agent provides to the host at least some of the virtual memory addresses of the data to be sent to the destination;
- (iii) the host identifies to the sending agent the data addressed by the virtual memory addresses provided by the sending agent, wherein the host identifying data comprises the host providing to the sending agent the physical addresses of the locations containing the data addressed by the virtual memory addresses provided by the sending agent and wherein the data identified by the host is stored in the memory and the physical addresses provided by the host are physical locations of the memory containing the data addressed by the virtual addresses provided by the sending agent; and
- (iv) the sending agent sends the identified data to the destination; wherein the host is further adapted to pin the physical memory locations of the memory provided by the host to the sending agent to prevent the data addressed by the virtual addresses provided by the sending agent from being swapped to the data storage; wherein the sending agent is further adapted to retrieve from the pinned physical memory locations of the memory, the data addressed by the virtual addresses provided by the sending agent; and at least one of the sending agent and the host is further adapted to unpin the pinned physical memory locations of the memory after the sending agent sends to the destination the data addressed by the virtual addresses provided by the sending agent.

- Claim 12, The system of claim 11 wherein the system further comprises a buffer and wherein ~~the host identifying data comprises the host providing to the sending agent the data addressed by the virtual addresses provided by the sending agent, and wherein~~ the sending agent is further adapted to store the data received from the host in the buffer.

- Claim 13, (Canceled)
- Claim 14, (Canceled)
- Claim 15, (Canceled)
- Claim 16, The system of claim 11 wherein the sending agent is further adapted to receive from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination; and wherein the virtual memory addresses provided by the sending agent to the host are the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination.

- Claim 17, The system of claim 11 wherein the sending agent is further adapted to:
  - receive from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination; and
  - provide to the host the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination;

wherein the host is further adapted to identify to the sending agent the unacknowledged data addressed by the virtual memory addresses provided by the sending agent; and

wherein the sending agent is further adapted to resend the identified unacknowledged data to the destination.

- Claim 18, The system of claim 11 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent at least one data structure which includes an address field containing the virtual address of one of a plurality of locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data; and a sequence number field containing a value representing a packet sequence number associated with data within the block of data.

- Claim 19, The system of claim 11 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent a plurality of data structures, wherein each data structure includes an address field containing the virtual address of one of a plurality of memory locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data, a sequence number field containing a value representing the packet sequence number associated with data within the block of data; and a link field containing the virtual address of another data structure of the plurality of data structures.

- Claim 20, The system of claim 11 ~~wherein the data to be sent to the~~

~~destination is stored in the memory, and wherein at least one of the host and the sending agent is adapted to:~~

~~pin the locations of the memory storing the data to be sent to prevent the data to be sent from being swapped to the data storage;~~

~~wherein the host is further adapted to provide to the sending agent in addition to the virtual memory addresses of the data to be sent, the physical addresses of the locations of the memory storing the data to be sent;~~

~~wherein the sending agent is further adapted to retrieve from the pinned locations of the memory, the data to be sent; and to unpin the pinned locations of the memory storing the data to be sent after the sending agent retrieves the data from the pinned locations of the memory storing the data to be sent;~~

~~and wherein the sending agent in sending the identified data to the destination is adapted to send the identified data in data packages over a network to the destination in accordance with at least a transport protocol.~~

- Claim 21, An article of manufacture for sending data from a source to a destination, the operations comprising:

a host of the source providing to a sending agent of the source, virtual memory addresses of data to be sent to a destination wherein the data is stored in a plurality of unpinned physical locations of the source, each location having a physical address and a virtual memory address which is mapped to the physical address, and wherein the physical locations include locations of a first memory and locations of a second memory;

the sending agent providing to the host of the source at least some of the virtual memory addresses of the data to be sent to the destination;

the host of the source identifying to the sending agent the data addressed by the virtual memory addresses provided by the sending agent and wherein the host identifying data comprises the host providing to the sending agent the physical addresses of the locations containing the data addressed by the virtual memory addresses provided by the sending agent, and the data identified by the host is stored in the first memory and the physical memory addresses provided by the host are physical memory locations of the first memory containing the data addressed by the virtual addresses provided by the sending agent; and

the sending agent sending the identified data to the destination;

the operations further comprising:

pinning the physical memory locations of the first memory provided by the host to the sending agent to prevent the data addressed by the virtual addresses provided by the sending agent from being swapped to the second memory;

the sending agent retrieving from the pinned physical memory locations of the first memory, the data addressed by the virtual addresses provided by the sending agent; and

unpinning the pinned physical memory locations of the first memory after the sending agent sends to the destination the data addressed by the virtual addresses provided by the sending agent.

- Claim 22, The article of manufacture of claim 21 wherein the host

~~identifying data comprises the host providing to the sending agent the data addressed by the virtual addresses provided by the sending agent~~, said operations further comprising comprise the sending agent storing the data received from the host in a buffer of the sending agent.

- Claim 23, (Canceled)
- Claim 24, (Canceled)
- Claim 25, (Canceled)
- Claim 26, The article of manufacture of claim 21 wherein the operations

further comprise receiving from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination; wherein the virtual memory addresses provided by the sending agent to the host are the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination

• Claim 27, The article of manufacture of claim 21 wherein the operations further comprise:

receiving from the destination an acknowledgment for data successfully sent by the sending agent and received by the destination;

the sending agent providing to the host the virtual addresses of data sent by the sending agent to the destination but not acknowledged as successfully received by the destination;

the host identifying to the sending agent the unacknowledged data addressed by the virtual memory addresses provided by the sending agent; and

the sending agent resending the identified unacknowledged data to the destination.

- Claim 28, The article of manufacture of claim 21 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent at least one data structure which includes in an address field containing the virtual address of one of a plurality of memory locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data; and a sequence number field containing a value representing a packet sequence number associated with data within the block of data.

- Claim 29, The article of manufacture of claim 21 wherein the host providing virtual addresses to the sending agent includes the host providing to the sending agent a plurality of data structures, wherein each data structure includes in an address field, the virtual address of one of a plurality of memory locations storing a block of data to be sent to the destination, a size field containing a value representing the size of the block of data, a sequence number field containing a value representing the packet sequence number associated with data within the block of data; and a link field containing the virtual address of another data structure of the plurality of data structures.

- Claim 30, The article of manufacture of claim 21 wherein ~~the physical locations include locations of a first memory and a second memory and the data to be sent to the destination is stored in the first memory, the operations further comprising,~~

~~pinning the locations of the first memory storing the data to be sent to prevent the data to be sent from being swapped to the second memory;~~

~~the host providing to the sending agent in addition to the virtual memory addresses of the data to be sent, the physical addresses of the locations of the first memory storing the data to be sent;~~

~~the sending agent retrieving from the pinned locations of the first memory, the data to be sent; and~~

~~unpinning the pinned locations of the first memory storing the data to be sent after the sending agent retrieves the data from the pinned locations of the first memory storing the data to be sent;~~

~~and wherein the sending by the sending agent of the identified data to the destination includes sending the identified data in data packages over a network to the destination in accordance with at least a transport protocol.~~

#### ***Allowable Subject Matter***

3. The following is an examiner's statement of reasons for allowance:
4. Claims 1, 11, and 21 are allowed.
5. Prior art singly or in combination fails to teach the claim limitation, among other thing, the combination of the arrangement of where source side (host) providing the source's sending agent with range of virtual addresses to be transmitted to destination and the addresses are stored between first and second memory pinned/unpinned and further, sending agent retrieves the addresses from a pinned/locked physical memory

locations of the memory by unlocking/unpinning the location and after which sending agent of the source transmits the provided data addresses to the destination.

6. Claims 2, 6-10, 12, 16-20 and 22, 26-30 are dependent from independent claims 1, 11 and 21 above and further limit the parent claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAUQIR HUSSAIN whose telephone number is (571)270-1247. The examiner can normally be reached on 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571 272 3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. H. /  
Examiner, Art Unit 2152

/Bunjob Jaroenchonwanit/  
Supervisory Patent Examiner, Art Unit 2152